

DRIFTER NEWSLETTER #13

October 2014

New Rigs

As reported last year, our latest surface drifter has an aluminum frame. Dozens of these “Irinas” have now been deployed with varying success but, in general, seem to be a good easy solution. The first variation of these consisted of a 4’ length of 1”-square aluminum pipe with a mast-extension made from either circular aluminum pipe or wooden broom handles but now we have done away with the mast-extension and simply use a **5’ length of square pipe** for the mast along with 4’-lengths of $\frac{3}{8}$ ” aluminum rods for spars.

We worked on these new designs in series of drifter building workshops in 2014 with the three most extensive sessions being sponsored by WHOI/NERACOOS, the Gulf of Maine Institute, and the Ocean Exploration Trust.



Irina Drifter

As usual, new ideas come out of these workshops often coming from the young participants. One untested idea, for example, is to use a 3’-length of “floatie” material around the top half of the mast as an alternative to using buoys for flotation. We have shied away from using this



Teachers at the WHOI/NERACOOS Drifter Workshop in May 2014

material in the past thinking that it may not hold up to months of seawater and sun but, perhaps if it was wrapped in some sort of protective coat, it may work! One advantage is that these “floaties” are readily found in any large department stores. Other ideas coming from the students is to secure the acorn buoys horizontally rather than vertically and, in the case of the “Colin” drogued flotation, insert a 1-meter length of pipe through the surface float to keep it more vertically stable (less roll) and therefore have the transmitter more likely facing skyward.

Another flotation solution comes to us from the Newburyport MA middle-school students who cut out three 8”-diameter circular slices of **2” pink insulation** material and sandwiched them together with a few pieces of exterior plywood. Their drifter lasted months at sea before it came shore in very good shape. They also discovered that the transmitter can

stand vertically and still provide good fixes. So, there is no end to the ideas on how to improve these designs and we continue to provide an engineering challenge to all the students involved.

A few dozen surface drifters were deployed this past year using a **4X4 wooden masts**. We first experimented with this design during the response to the BP oil spill in 2010. While we did not have much success, those rigged this year by both graduate students at UCONN and government scientist in Scotland, seem to be doing fine.



Pop-up Leaf Bag used for the Drogue Drifter

We deployed several more **drogued drifters** this year using the popup leaf bags. We had one last for nearly a month in Nantucket Sound and another circled around Cape Cod Bay for over a month before it finally escaped the bay and dragged on sand bar on the outer beach. One of the issues with these units is the lack of “drogue-loss-sensors” normally secured to commercial variations of drogued drifters. While it is usually obvious when a drifter loses a drogue, it is not always detectable and one needs to be careful on how to interpret the tracks.

Another issue in shallow water is the velocity statistics can be biased due to the drifter occasionally dragging the bottom. Since the popup leaf bags are not made of very durable material, they can tear in rocky bottoms. One option we are looking into as an alternative to leaf bags is the child’s play tunnels as sold at Toy-R-Us, for example. Another problem we ran into this year is that the the drogued drifters fitted with several shackles are easy prey to fishermen thinking they have come across marine debris. We have learned to document the purpose of the drifter more clearly on the drogues flotation.

Proposals

Our two biggest proposals this year were unsuccessful. We were most excited about one we submitted to Canada’s Marine Environment Ocean Prediction and Response (MEOPAR) along with several Canadian universities. We were proposing to hold a series of workshops at these universities where we not only built drifters but worked on ways to simulate particle tracks through numerical flow fields. We are committed to this new aspect of the program in generating computer-generated drifter tracks. We still plan to have a small workshop this fall in Woods Hole and are inviting anyone who



Students learning about drifters at the Weymouth STEM Conference for Girls

may be interested in this “**particle tracking**” activity.

Earlier this year we started looking into various charitable **foundations** who may be interested in funding STEM projects. We have started to compile various googlesheets listing these foundations as well as lists of drifter users and their contact info. We have archived a collection of mini-proposals that can be adjusted according to particular RFPs so, if anyone hears of a relevant opportunity, let us know and we will “share” these documents. Our hope is to be able to provide schools with transmitters and satellite fees without their needing to apply for funding themselves. Most public schools can not afford the ~\$600 needed to deploy a drifter. We are beginning to organize some proposals to go into both “NOAA B-WET” and perhaps “NSF Advanced Informal STEM Learning” in the coming onths. John Terry (Gulf of Maine Institute) is leading the B-WET proposal. We will be talking with many of our colleagues at the Annual New England Ocean Science Education Collaborative meeting in 6-7 November, 2014.



4th Graders at Truro Elementary School building a drifter on NOAA Ocean Day

New Partners and Individuals

We are happy to add the following list of institutions/schools who have just joined us this year:

- Gray Reef National Marine Sanctuary
- Univ. of Maryland
- South Shore Natural Science Center
- Coast Encounters
- Concord MA Public Schools
- Nock Middle School
- New Hampshire Science Teachers Association
- Seacoast Science Center
- SeaKeepers Society
- Ocean Exploration Trust
- Mystic Aquarium.

A big acknowledgement to Anthony Kirincich and Irina Rypina (WHOI) for funding about a dozen drifters for teachers with their NSF education and outreach allocation, to Cassie Stymiest (NERACOOS) for promoting the drifter project a few national conferences, Jessica McManus (Mass Audubon) for her enthusiastic effort to teach drifters to summer school students, Abby Smith (WHSTEP) for her help with drifter promotion this past year, student interns Conner Warren, Ed Crosier, Nkosi Muse, Huanxin Xu, Bingwei Ling, Zhoabin Dong, and Jian Cui for help with coding this past summer, and, as always, Erin Pelletier (GOMLF) for keeping our accounts in order.

New Website to Check the Number of Your Transmissions Against Those You Paid For

See

www.nefsc.noaa.gov/drifter/fixcounts.html is

very much “in progress”. This is only updated on a near-monthly basis but at least it gives you an idea of where you stand with transmission use.

Decommissioning old transmitters

It is very important that you notify us when to “decommission” old transmitters that you do not plan to use in the coming year. This way the satellite company can no longer charge the \$2.45/month “maintenance fee”. Please let us know if you have any transmitters that are still being charged.

Future Plans

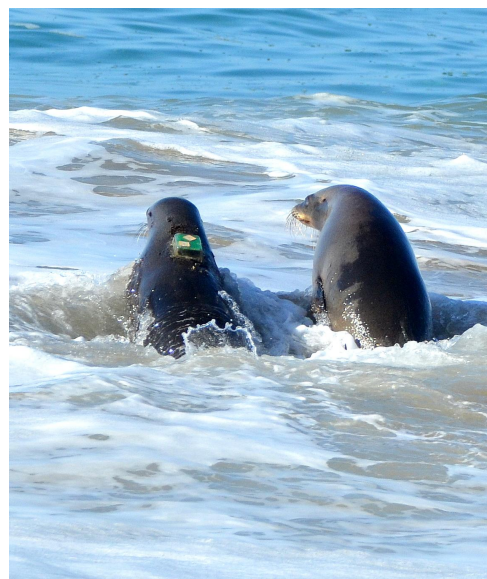
We hope to improve our “lesson plan” options on the studentdrifters.org pages. The construction manuals also need to be up-to-date with all the new developments as noted above. The new Student Drifters facebook page can be found here: www.facebook.com/studentdrifters. Please feel free to upload any drifter photos or discoveries on this site.

Where the last few years we started tracking unmanned sailboats on the same pages as the drifters, we hope to start tracking large marine animals (whales, sharks, turtles, seals, etc). We have worked out a way to epoxy the transmitters so they can survive a deep dive. While we do not expect too many fixes since the animals has to be at the surface long enough for a fix, we could potentially provide biologist with a low-cost solution to multi-month position tracking. In at least one case, we have tracked a sea lion off the coast of California for more than a month and have documented its

movement to various outcrops where it hauls out.

Also, we have a new transmitter called the “AP2S” that allows us to attach external sensors such as temperature. We hope to be installing this new transmitter not only on drifters and animals but on commercial fishing boats as a means of ship-to-shore telemetry of any kind of data. The National Weather Service, for example, is interested in getting routine readings of air temp, wind, and humidity. There are lots of possibilities that, one way or another, may provide us with the funding needed to do science and STEM education.

As I hope to devote more time to research and development, the day-to-day drifter operations may be transferred to others in the future. Erin will continue to handle the accounts and be liaison with satellite companies. Abby will continue to provide some coordination with educators and Cassie with IOOS. The hope is that we have a team of individuals to handle various tasks and that it is always fun for those involved. If it is not fun we shouldn't be doing it. -JiM



Sea Lion, “RyBy” Being Tracked in California